

CLAIMS

What is claimed is:

1. A system that facilitates soft defect detection and analysis on a reticle, comprising:
 - a scanning component that detects and images soft defects;
 - a milling component that excises material at soft defect locations; and
 - an analysis component that determines whether a signature is present in the chemical composition of a soft defect.
2. The system of claim 1, the reticle comprising a pellicle.
3. The system of claim 1, the signature is indicative of the presence of at least one of sulfur, phosphorus, and an amino group.
4. The system of claim 1, the scanning component comprising at least one of a Scanning Electron Microscope and a Focused Ion Beam.
5. The system of claim 1, the milling component comprising a Focused Ion Beam.
6. The system of claim 5, the Focused Ion Beam comprising at least one of a single-beam Focused Ion Beam and a dual-beam Focused Ion Beam.
7. The system of claim 1, the analysis component comprising at least one of an Electron Microscope for Chemical Analysis and a Fourier Transform Infrared Spectroscope.
8. The system of claim 1, further comprising:
 - a processor operatively coupled to the scanning, milling, and analysis components for sending and receiving information to and from the components; and

a memory operatively coupled to the processor for storing information received and sent by the processor.

9. The system of claim 8, the memory comprising at least one of volatile and non-volatile memory.

10. The system of claim 8, further comprising a feedback loop between the processor and at least one of the scanning, milling, and analysis components that facilitates predicting soft defect growth with respect to time.

11. A method that facilitates soft defect detection and analysis on a reticle, comprising:

Scanning and imaging soft defects;

Milling detected soft defects to remove contaminants; and

Analyzing detected soft defects to determine whether a signature is present in the chemical composition of the soft defects.

12. The method of claim 11, the reticle is scanned in a non-pellicle region.

13. The method of claim 11, the signature is indicative of the presence of at least one of sulfur, phosphorus, and an amino group.

14. The method of claim 11, the soft defect is scanned and imaged *via* employing at least one of a Scanning Electron Microscope and a Focused Ion Beam.

15. The method of claim 11, the soft defect is milled *via* employing a Focused Ion Beam.

16. The method of claim 11, the soft defect is analyzed *via* Electron Spectroscopy for Chemical Analysis if the soft defect is smaller than a predetermined size.

17. The method of claim 11, the soft defect is analyzed *via* Fourier Transform Infrared Spectroscopy if the soft defect is larger than a predetermined size.

18. The method of claim 11, further comprising making a determination as to whether a detected signature is detrimental to reticle performance.

19. The method of claim 11, further comprising employing closed-loop feedback to facilitate predicting soft defect growth with respect to time.

20. A method that facilitates treatment of a signature associated with a soft defect, comprising:
employing a Focused Ion Beam in a non-reactive gas environment;
effecting a phase shift in the signature to a gaseous state; and
providing a continuous pump-out of the non-reactive gas environment to remove a signature in gaseous form.

21. A system that facilitates soft defect detection and analysis on a reticle, comprising:
means for scanning and imaging a soft defect;
means for milling the soft defect; and
means for analyzing the soft defect to determine whether a signature is present in the chemical composition of the soft defect.

22. The system of claim 21, further comprising means to determine whether the signature is indicative of the presence of at least one of sulfur phosphorus, and an amino group.

23. The system of claim 21, further comprising:
means for processing information related to the detection and analysis of a soft defect; and
means for storing information related to detection and analysis of a soft defect.

24. The system of claim 21, further comprising means for converting a signature to gaseous form for removal from the reticle.